

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 77-4

WASTE DISCHARGE REQUIREMENTS FOR:

CITY OF PETALUMA
CLASS II-2 SOLID WASTE DISPOSAL SITE
PETALUMA, SONOMA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Board) finds that:

1. City of Petaluma, hereinafter called the discharger, submitted a report of waste discharge dated April 16, 1976, for its existing landfill. The site is located south of the City near the Petaluma River at the end of Casa Grande Road, as shown in Attachment A which is made a part of this Order.
2. The discharger proposes to operate, maintain and improve the site for disposal of broken concrete, rubble, dirt, street sweepings, leaves, brush and tree stumps. Refuse is received at annual rate of about 3800 cubic yards. The site has been used in the past for disposal of municipal refuse.
3. This landfill site, subsequent to modifications required to comply with this Order, will meet the criteria contained in the California Administrative Code, Title 23, Chapter 3, Subchapter 15, for classification as a Class II-2 disposal site suitable to receive Group 3 wastes and certain defined types of group 2 wastes.
4. The beneficial uses of Petaluma River are:
 - a. Fish migration and habitat
 - b. Recreation including swimming
 - c. Esthetic enjoyment
 - d. Navigation
 - e. Habitat and resting for waterfowl and migratory birds
 - f. Agricultural water supply
5. Land within 1000 feet of this site is used for residential and industrial purposes and is traversed by the Petaluma River.
6. The Board adopted a Water Quality Control Plan for the San Francisco Bay Basin, in April 1975, and this Order implements the water quality objectives stated in that plan.

7. The Board has notified the discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
8. The Board, in a public meeting heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, that City of Petaluma or any other persons that shall own the land or operate this landfill shall comply with the following:

A. Waste Disposal Specifications

1. The treatment or disposal of wastes shall not create a nuisance as defined in Section 13050(m) of the California Water Code.
2. Waste materials shall be confined to the disposal site as shown on Attachment A at all times and shall not be placed in any position where they can be carried from the disposal site and discharged into waters of the State.
3. Biodegradable wastes material shall not be placed or allowed to contact ponded water from any source whatsoever.
4. Waste materials deposited at this site shall be limited to group 3 wastes and the following categories of dry group 2 wastes generated within the City of Petaluma: street sweepings, tree cuttings, brush, and leaves.
5. No group 1 wastes shall be disposed of at the site.
6. The discharger shall remove and relocate any wastes which are discharged at this site in violation of these requirements.

B. Leachate and Drainage Specifications

1. Leachate from Group 2 waste or ponded water containing leachate shall not be discharged to waters of the State. Water used during disposal site operations shall be limited to a minimal amount reasonably necessary for dust control purposes and fire suppression.
2. The disposal area(s) shall be protected from any washout or erosion of wastes or covering material, which could occur as a result of floods having a predicted frequency of once in 100 years.
3. Surface drainage from tributary areas, and internal site drainage from surface or subsurface sources shall not contact or percolate through Group 2 wastes deposited on the site.
4. All completed disposal areas shall be compacted and covered with compacted impervious material. The exterior surfaces shall be graded to promote lateral runoff of precipitation and to prevent ponding.

5. The discharge of waste shall not cause the following conditions to exist in waters of the State at any place:
 - a. Floating, suspended, or deposited macroscopic particulate matter;
 - b. Bottom deposits or aquatic growths;
 - c. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;
 - d. Visible, floating, suspended or deposited oil or other products of petroleum origin;
 - e. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration.

C. Provisions

1. The discharger shall comply with all sections of this Order except Section B immediately upon its adoption.
2. No later than February 18, 1977, the discharger shall submit to the Regional Board a report on the site to include the following:
 - a. The status of compliance with Section B of this Order.
 - b. For any specifications not being completed with, a conceptual plan and time schedule shall be submitted.

In any event, full compliance with this Order shall be achieved no later than November 15, 1977.

3. The discharger shall file with this Board a report of any material change or proposed change in the character, location, or quantity of this waste discharge. For the purpose of these requirements, this includes any proposed change in the boundaries, contours, or ownership of the disposal area(s).
4. One hundred-eighty (180) days prior to discontinuing use of this site for waste disposal, the discharger shall submit a technical report to the Board describing the methods and controls used to assure protection of the quality of surface and groundwaters of the area during final operations and during any subsequent use of the land. The method used to close the site and maintain protection of the quality of the surface and groundwaters shall comply with waste discharge requirements established by the Regional Board.
5. This Board considers the property owner to have a continuing responsibility for correcting any problems which may arise in the future as a result of this waste discharge or water applied to this property during subsequent use of the land for other purposes.

6. The discharger shall file with the Board technical reports on self-monitoring work performed according to the detailed specifications contained in any Monitoring and Reporting Program which may be directed by the Executive Officer.
7. The discharger shall permit the Regional Board:
 - a. Entry upon premises on which wastes are located or in which any required records are kept,
 - b. Access to copy any records required to be kept under terms and conditions of this Order,
 - c. Inspection of monitoring equipment or records, and
 - d. Sampling of any discharge.

I, Fred H. Dierker, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on January 18, 1977.

FRED H. DIERKER
Executive Officer

Attachment:
Map "A"

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM
FOR

CITY OF PETALUMA

CLASS II-2 SOLID WASTE DISPOSAL SITE

PETALUMA, SONOMA COUNTY

ORDER NO. 77-4

CONSISTS OF

PART A

AND

PART B

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR

CITY OF PETALUMA CLASS II-2
SOLID WASTE DISPOSAL SITE
PETALUMA, SONOMA COUNTY

PART A

A. GENERAL

Reporting responsibilities of waste dischargers are specified in Sections 13225(a), 13267(b), 13268, 13383, and 13387(b) of the California Water Code and this Regional Board's Resolution No. 73-16.

The principal purposes of a monitoring program by a waste discharger, also referred to as self-monitoring program, are: (1) to document compliance with waste discharge requirements and prohibitions established by this Regional Board, (2) to facilitate self-policing by the waste discharger in the prevention and abatement of pollution arising from waste discharge, (3) to develop or assist in the development of effluent or other limitations, discharge prohibitions, national standards of performance, pretreatment and toxicity standards, and other standards, and (4) to prepare water and wastewater quality inventories.

B. SAMPLING AND ANALYTICAL METHODS

Sample collection, storage, and analyses shall be performed according to the latest edition of Standard Methods for the Examination of Water and Wastewater prepared and published jointly by the American Public Health Association, American Water Works Association, and Water Pollution Control Federation, or other methods approved and specified by the Executive Officer of this Regional Board, including the methods specified in attached APPENDIX F.

Water and waste analyses shall be performed by a laboratory approved for these analyses by the State Department of Health or a laboratory approved by the Executive Officer. The director of the laboratory whose name appears on the certification shall supervise all analytical work in his laboratory and shall sign all reports of such work submitted to the Regional Board.

All monitoring instruments and equipment shall be properly calibrated and maintained to ensure accuracy of measurements.

C. DEFINITION OF TERMS

1. Grab sample means a sample collected at any time.

2. Standard Observations

a. Receiving Water of Petaluma River and Adjacent Slough Tributary to Petaluma River

- (1) Discoloration and turbidity: description of color, source, and size of affected area.
- (2) Odor: presence or absence, characterization, source, and distance of travel.
- (3) Evidence of beneficial water use: presence of water-associated wildlife, fishermen, and other recreational activities in the vicinity of the sampling stations.
- (4) Hydrographic condition:
 - (a) Water and sampling depths.
- (5) Weather condition:
 - (a) Wind - direction and estimated velocity.
 - (b) Precipitation - total precipitation during the previous five days and on the day of observation.

b. Land Retention or Disposal Area

This applies both to solid wastes confined or unconfined.

- (1) Evidence of leaching liquid from area of confinement and estimated size of affected area. (Show affected area on a sketch.)
- (2) Odor: presence or absence, characterization, source, and distance of travel.
- (3) Estimated number of waterfowl and other water-associated birds in the disposal area and vicinity.

D. SCHEDULE OF SAMPLING, ANALYSES, AND OBSERVATIONS

The discharger is required to perform observations, sampling, and analyses according to the schedule in Part B.

E. RECORDS TO BE MAINTAINED

1. Written records shall be maintained at the landfill site or office and shall be retained for a minimum of 3 years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or when requested by the Regional Board. Such records shall show the following for each sample:
 - a. Identity of sampling and observation stations by number.
 - b. Date and time of sampling and/or observations.

- c. Date and time that analyses are started and completed, and name of personnel performing the analyses.
- d. Complete procedure used, including method of preserving sample and identity and volumes of reagents used. A reference to specific section of Standard Methods is satisfactory.
- e. Calculations of results.
- f. Results of analyses and/or observations.

F. REPORTS TO BE FILED WITH THE REGIONAL BOARD

- 1. Written reports shall be filed for each calendar month (unless specified otherwise in Part B) by the fifteenth day of the following month. In addition, an annual report shall be filed as indicated in F-1-f. The reports shall be comprised of the following:

- a. Letter of Transmittal:

A letter transmitting self-monitoring reports should accompany each report. Such a letter shall include a discussion of requirement violations found during the past month and actions taken or planned for correcting violations, such as plant operation modifications and/or plant facilities expansion. If the discharger has previously submitted a detailed time schedule for correcting requirement violations, a reference to the correspondence transmitting such schedule will be satisfactory. The letter shall contain a statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true and correct.

Monitoring reports shall be signed as follows:

- (1) In the case of corporations, by a principal executive officer at the level of vice-president or his duly authorized representative if such representative is responsible for the overall operation of the facility from which the discharge originates,
- (2) In the case of a partnership, by a general partner, or
- (3) In the case of a sole proprietorship, by the proprietor,
- (4) In the case of a municipal, State, or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

- b. Compliance Evaluation Summary

Each report shall be accompanied by a compliance evaluation summary sheet prepared by the discharger. The report format will be specified by the Regional Board.

c. Map or Aerial Photograph

A map or aerial photograph shall accompany the report showing sampling and observation station locations.

d. Results of Analyses and Observations

Tabulations of the results from each required analysis specified in Part B by date, time, type of sample, and station, signed by the laboratory director. The report format will be specified by the Regional Board.

e. List of Approved Analyses

- (1) Listing of analyses for which the discharger is approved by the State Department of Health.
- (2) List of analyses performed for the discharger by another approved laboratory (and copies of reports signed by the laboratory director of that laboratory shall also be submitted as part of the report).

f. Annual Reporting

By January 30 of each year, the discharger shall submit an annual report to the Regional Board covering the previous calendar year. The report shall contain:

1. Tabular and graphical summaries of the monitoring data obtained during the previous year.
2. Comprehensive discussion of the compliance record and the corrective actions taken or planned which may be needed to bring the discharger into full compliance with the waste discharge requirements.
3. A map showing the area in which filling has been completed during prior calendar year.

PART B

I. DESCRIPTION OF SAMPLING STATIONS & SCHEDULE OF SAMPLING, ANALYSES & OBSERVATIONS FOR NORTH PARCEL

A. WASTE MONITORING

1. Monthly, record and report the total volume and weight, separately, of Group 2 and Group 3 waste (in cubic yards and tons) deposited on the site during the month, and the daily average. Report Quarterly

(Weight of the Group 2 and 3 wastes shall be estimated)

2. Monthly, record the volume of fill completed, in cubic yards, showing the location(s) and dimensions on a sketch or a map. Report Quarterly

B. ON SITE OBSERVATION

<u>Station</u>	<u>Description</u>
S-1 thru S-'n'	Observation stations located around the perimeter of the presently active area or completed portion of the site at equidistant interval not exceeding 200 feet.

<u>Station</u>	<u>Frequency of Observation</u>	<u>Observations</u>
All S Stations in active disposal areas	Weekly throughout the year Report Quarterly	<ol style="list-style-type: none">1. Evidence of ponded water at any point on the disposal site.2. Evidence of refuse not confined within a cell or parcel.3. Evidence of "day-lighted" refuse.4. Evidence of waste in contact with pools of surface water.5. Evidence of waste material not confined within appropriate disposal areas as classified.6. Evidence of odors presence or absence, the characteristics, intensity, source, distance of travel.

Observations

7. Evidence of leachate or water entering or leaving the disposal site, and estimated size of affected area.

C. LEACHATE MONITORING

<u>Station</u>	<u>Description</u>
L-1 thru L-'n'	Each discharge point from the disposal area. Include map indicating locations of discharge(s).

<u>Station</u>	<u>Type of Samples and Frequency</u>	<u>Analyses</u>	<u>Units</u>
All L Stations	Daily, during each discharge or occurrence. Report monthly	D.O. Dissolved sulfide Turbidity Odors Color pH	mg/l mg/l JTU description description electrometric units

I, Fred H. Dierker, Executive Officer, do hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Regional Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in the Regional Board Order No. 77-4.
2. Has been ordered in writing by the Executive Officer on January 18, 1977 and becomes effective immediately.
3. May be reviewed at any time subsequent to the effective date upon written notice from either the Executive Officer or the discharger, and will be revised upon written agreement of the Executive Officer and the discharger.

FRED H. DIERKER
Executive Officer

12/6/76
MUK/tmh
Attachment:
Appendix B

Sample collection, storage, and analyses shall be performed according to the latest edition of Standard Methods for the Examination of Water and Wastewater prepared and published jointly by the American Public Health Association, American Water Works Association, and Water Pollution Control Federation, or other methods approved and specified by the Executive Officer of this Regional Board.

Water and waste analyses shall be performed by a laboratory approved for these analyses by the State Department of Health or a laboratory approved by the Executive Officer. The director of the laboratory whose name appears on the certification shall supervise all analytical work in his laboratory and shall sign all reports of such work submitted to the Regional Board.

Federal regulations were published (Table I, 40 CFR136, October 16, 1973) governing the methods that are to be used in analyzing wastes for pollutants. Dischargers are required to use Standard Methods for all parameters for which EPA and State Department of Health approves Standard Methods. Table II lists those constituents for which a test in Standard Methods was not deemed acceptable and lists the method and reference that is considered acceptable.

If a discharger wishes to use an alternate method to Standard Methods which is approved by EPA, this request may be approved by the Executive Officer.

Under certain circumstances other methods will be approved by EPA on a case-by-case basis and upon request by the discharger.

Such a request may be made by letter until printed application forms are made available. The letter or application should contain the following information:

1. The name and address of the responsible person or firm making the discharge (if not the applicant), the permit number, the issuing agency, and the discharge serial number;
2. Identify the pollutant or parameter for which approval of an alternate testing procedure is being requested;
3. Justification for using testing procedures other than those specified;
4. A detailed description of the proposed alternate test procedure, together with references to published studies of the applicability of the alternate test procedure to the effluents in question.

The regional board executive officer should forward the application letter to the State Board. The application will then be transmitted to the Department of Health with a request for comments and recommendations.

terminated by one of the standard analytical methods cited and described in Table I, or under certain circumstances by other methods that may be more advantageous to use when such other methods have been previously approved by the Regional Administrator of the Region in which the discharge will occur, and providing that the Director of the State in which such discharge will occur does not object to the use of such alternate test procedures.

Under certain circumstances the Regional Administrator or the Director in the Region or State where the discharge will occur may determine for a particular discharge that additional parameters or pollutants must be reported. Under such circumstances, additional test procedures for analysis of pollutants may be specified by the Regional Administrator or Director upon the recommendation of the Director of the State in which such discharge will occur does not object to the use of such alternate test procedures.

Table I—List of Approved Test Procedures

Parameter and units	Method	References		
		Standard methods	ASTM	EPA methods
General analytical methods:				
1. Alkalinity as CaCO ₃ mg/liter.	Titration: electrometric, manual or automatic method—methyl orange.	p. 370	p. 143	p. 6
2. B.O.D. 5-day method.	Modified Winkler or probe method.	p. 450		p. 8
3. Chemical oxygen demand (C.O.D.) mg/liter.	Dichromate reflux.	p. 455	p. 219	p. 17
4. Total solids mg/liter.	Gravimetric 103-105° C.	p. 555		p. 250
5. Total dissolved (filterable) solids mg/liter.	Glass fiber filtration 180° C.			p. 275
6. Total suspended (non-filterable) solids mg/liter.	Glass fiber filtration 103-105° C.	p. 557		p. 278
7. Total volatile solids mg/liter.	Gravimetric 550° C.	p. 556		p. 282
8. Ammonia (as N) mg/liter.	Nitration—nesslerization or titration after formation of phenylhydrazone.			p. 131
9. Kjeldahl nitrogen (as N) mg/liter.	Digestion + distillation—nesslerization or titration after formation of phenylhydrazone.	p. 459		p. 141
10. Nitrate (as N) mg/liter.	Cadmium reduction; bismuth sulfate reduction; cadmium or hydrazine reduction.	p. 458	p. 124	p. 157
11. Total phosphorus (as P) mg/liter.	Phosphomolybdate and stannous chloride (ascorbic acid), or manual digestion and automated single reagent or stannous chloride.	p. 556	p. 42	p. 245
12. Active mg CaCO ₃ /liter.	Electrometric end point or phenolphthalein end point.	p. 552		p. 246
13. Total organic carbon (TOC) mg/liter.	Combustion—infrared method.	p. 557	p. 148	p. 259
14. Hardness—total mg CaCO ₃ /liter.	EDTA titration; automated colorimetric atomic absorption.	p. 179	p. 702	p. 221
15. Nitrite (as N) mg/liter.	Manual or automated colorimetric diazotization.		p. 170	p. 76
Analytical methods for trace metals:				
16. Aluminum—total mg/liter.	Atomic absorption.	p. 219		p. 78
17. Antimony—total mg/liter.	Atomic absorption.			p. 158
18. Arsenic—total mg/liter.	Picosection plus silver diethyldithiocarbamate atomic absorption.	p. 65		p. 195
19. Barium—total mg/liter.	Atomic absorption.	p. 210		
20. Beryllium—total mg/liter.	Atomic absorption.	p. 210		
21. Boron—total mg/liter.	Cadmium.	p. 69		
22. Cadmium—total mg/liter.	Atomic absorption; colorimetric.	p. 210	p. 492	p. 101
23. Calcium—total mg/liter.	EDTA titration; atomic absorption.	p. 210		
24. Chromium VI mg/liter.	Extraction and atomic absorption; colorimetric.	p. 81	p. 992	p. 102
		p. 459		p. 94

Parameter and units	Method	References	
		Standard methods	EPA methods
25. Chromium—total mg/liter.	Atomic absorption; colorimetric.	p. 210	p. 104
26. Cobalt—total mg/liter.	Atomic absorption.	p. 425	p. 408
27. Copper—total mg/liter.	Atomic absorption; colorimetric.	p. 210	p. 108
28. Iron—total mg/liter.	do.	p. 130	p. 108
29. Lead—total mg/liter.	do.	p. 438	p. 110
30. Manganese—total mg/liter.	Atomic absorption; Gravimetric.	p. 210	p. 112
31. Magnesium—total mg/liter.	Atomic absorption.	p. 210	p. 114
32. Mercury—total mg/liter.	Flameless atomic absorption.	p. 210	p. 114
33. Molybdenum—total mg/liter.	Atomic absorption.	p. 210	p. 114
34. Nickel—total mg/liter.	Atomic absorption; colorimetric.	p. 413	p. 62
35. Potassium—total mg/liter.	Atomic absorption; colorimetric flame photometry.	p. 283	p. 325
36. Sodium—total mg/liter.	Atomic absorption.	p. 210	p. 118
37. Silver—total mg/liter.	Atomic absorption.	p. 210	p. 118
38. Sulfate—total mg/liter.	Flame photometric atomic absorption.	p. 317	p. 335
39. Tantalum—total mg/liter.	Atomic absorption.	p. 210	p. 118
40. Tin—total mg/liter.	do.	p. 210	p. 118
41. Vanadium—total mg/liter.	do.	p. 210	p. 118
42. Vanadium—total mg/liter.	Atomic Absorption; Colorimetric.	p. 157	p. 157
43. Zinc—total mg/liter.	Atomic Absorption; Colorimetric.	p. 210	p. 120
Analytical methods for nutrients, nutrients, and nutrients:			
44. Organic nitrogen (as N) mg/liter.	Kjeldahl nitrogen minus ammonia nitrogen.	p. 444	p. 149
45. Orthophosphate (as P) mg/liter.	Direct single reagent; automated single reagent or stannous chloride.	p. 552	p. 42
46. Sulfate (as SO ₄) mg/liter.	Gravimetric; turbidimetric; automated.	p. 331	p. 235
47. Sulfide (as S) mg/liter.	Turbidimetric; barium chloride.	p. 331	p. 235
48. Silicate (as SiO ₂) mg/liter.	Thiochrome; molybdate.	p. 331	p. 235
49. Bromide mg/liter.	do.	p. 337	p. 235
50. Chloride mg/liter.	Silver nitrate; mercuric nitrate; automated.	p. 174	p. 23
51. Cyanide—total mg/liter.	Distillation—silver nitrate titration or mercuric nitrate colorimetric.	p. 337	p. 41
52. Fluoride mg/liter.	Distillation—SPADNS.	p. 174	p. 191
53. Chloride—total residual mg/liter.	Colorimetric; amperometric titration.	p. 332	p. 235
54. Oil and grease mg/liter.	Liquid-liquid extraction with trichloroethylene.	p. 254	p. 254
55. Phenols mg/liter.	Colorimetric; 4-AP.	p. 502	p. 455
56. Sulfonamides mg/liter.	Methylene blue colorimetric.	p. 330	p. 619
57. Alkalies mg/liter.	Gas chromatography.	p. 330	p. 131
58. Bivalent metals mg/liter.	Flame photometry—colorimetric.	p. 330	p. 131
59. Chlorinated organic compounds except pesticides mg/liter.	Gas chromatography.	p. 330	p. 131
60. Pesticides mg/liter.	Gas chromatography.	p. 330	p. 131
Analytical methods for physical and biological parameters:			
61. Color platinum-cobalt units or platinum-cobalt units.	Colorimetric; spectrophotometric.	p. 160	p. 38
62. Specific conductance at 25° C.	Wheatstone bridge.	p. 325	p. 133
63. Turbidity Jackson units.	Turbidimeter.	p. 330	p. 407

See Note at end of Table I

TABLE II

METHODS TO USE IN PREFERENCE TO
"STANDARD METHODS"

<u>Constituent</u>	<u>Units</u>	<u>Method</u>	<u>Reference</u>
Total dissolved solids (filterable)	mg/l	Glass fiber filtration- 180°C	EPA Methods ^{1/} - p. 275
Ammonia	mg N/l	Distillation-nesslerization or titration automated phenolate	EPA Methods - p. 134
Acidity	mg CaCO ₃ /l	Electrometric endpoint or phenolphthalein end point	ASTM ^{2/} - p. 148
Nitrite	mg N/l	Manual or automated color- imetric diazotization	EPA Methods - p. 185 p. 195
Antimony - total ^{6/}	mg/l	Atomic absorption	3/
Cobalt - total	mg/l	"	ASTM - p. 692
Molybdenum - total	mg/l	"	3/
Selenium - total	mg/l	"	3/
Thallium - total	mg/l	"	3/
Tin	mg/l	"	3/
Titanium	mg/l	"	3/

certain that the sample does not boil. Cool the beaker and add another 3 ml portion of distilled concentrated HNO_3 . Cover the beaker with a watch glass and return to the hotplate. Increase the temperature of the hotplate so that a gentle reflux action occurs. Continue heating, adding additional acid as necessary until the digestion is complete generally indicated by a light colored residue. Add (1:1 with distilled water) distilled concentrated HCl in an amount sufficient to dissolve the residue upon warming. Wash down the beaker walls and the watch glass with distilled water and filter the sample to remove silicates and other insoluble material that could clog the atomizer. Adjust the volume to some predetermined value based on the expected metal concentrations. The sample is now ready for analysis. Concentrations so determined shall be reported as "total".